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Letter to the Editor

A response to Granqvist et al. "Sensed presence and mystical experiences are predicted by suggestibility, not by the application of transcranial weak magnetic fields"

Dear Editor,

We have read Granqvist et al.'s article [5] entitled "Sensed presence and mystical experiences are predicted by suggestibility, not by the application of transcranial weak complex magnetic fields". Double blind studies are essential when exploring these phenomena. In all of our major studies [9–12,15,17] involving more than 400 subjects during the last 20 years the subjects were not aware of their experimental conditions and experimenters were not familiar with the hypotheses being tested or both were not aware of the experimental condition. Subjects had volunteered for "memory" or "relaxation" studies and were randomly or serially allocated to conditions. The "sensed presence" issue was never discussed. The person generating the hypothesis never had direct contact with the subjects.

These precautions are essential because application of specific patterns of weak (1 μT at distances equivalent to intracerebral space) complex magnetic fields over the right hemisphere enhances suggestibility [6]. We have repeatedly emphasized the importance of the context and the participants' beliefs, expectancies, and temporal lobe "sensitivities" with respect to how they interpret the experiences once they have been elicited by the experimental fields [4,10]. Although we applaud the enthusiasm of Granqvist et al. [5] to replicate our research, their methodology deviated significantly from the procedures known to evoke an experimental sensed presence.

The mean and standard deviation for the score for the incidence of sensed presence for the Granqvist et al. [5] study for both their experimental (magnetic field) and sham groups ($M = 0.3$, S.D. = 0.5 and $M = 0.3$, S.D. = 0.5) were identical to scores for sham field groups in our studies ($M = 0.3$, S.D. = 0.5). The mean scores for this scale when the appropriate fields are applied are 0.8 or higher. The likelihood that Swedish and Canadian students differ in their temporal lobe sensitivity is minimum because the equivalent scores for the former were .34 (10.3/30) and for the Canadians ($n = 1500$ over a 20-year period) have been 0.32 (S.D. = .15). We suggest the subjects in their experimental group never received an effective field configuration.

We are assuming that they followed our usual protocol and verified the presence of the field and the appropriate acoustic signature (timing) of the field before each subject. If this was followed, there are three possible explanations for the discrepancy between the results of our multiple studies over 20 years involving dozens of experimenters and the results of Granqvist et al. [5]. All of these possibilities assume that there are no nuances in local geomagnetic or structurally recondite factors, at present not measured, that are responsible for the discrepancy.

First, the software we gave them to generate the magnetic field configurations was designed for XT and 286 IBM PCs using DOS. Specific calibration programs are required when more advanced PCs or WINDOWS is employed. Faster computers and WINDOWS in particular distort the timing of the point durations and disconfigure the temporal patterns of the applied magnetic fields [7]. Reliable, real time values for the point durations are critical in this research [3,13–16]. For example, even the "Thomas" pattern, when presented in the reversed temporal sequence, is less effective for producing the sensed presence. In several rat studies [8] the potency of analgesia from these applied fields can be eliminated, similar to changing the impact of a drug by changing the position of an atom, by subtle changes in timing.

Second, Larsson and his colleagues had told us in 2000 when they visited the lab that they would be employing the equipment to discern the effects of weak magnetic fields for a PET (Positron Emission Tomography) study. Exposure for 15 min to a particular pattern was suggested for this context, not for a phenomenological or experiential study. Both our rat and human studies indicate that exposures of between 20 and 40 min are required for maximum response to weak magnetic fields [1,2,12,14]. The time required for electroencephalographic changes, such as altered proportions in alpha rhythms or "entrainment" requires more than 15 min of exposure to the fields.

Third, our basic protocol is for the subject to be blindfolded and to sit in a comfortable arm chair that is housed within a completely darkened acoustic chamber (which is also a grounded Faraday cage with the dimensions 2.74 m × 2.54 m × 1.98 m, high). The authors did not indicate the instructions given to the subjects. Our instructions always emphasize that the phenomena are subtle and request the subject to just experience whatever happens without la-

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belling the experiences. Although our subjects' ratings of exotic beliefs and temporal lobe sensitivities were moderately correlated (rhos between .40 and .45) with lifetime histories of experiencing a sensed presence as discerned by questionnaires completed during lecture periods two to four months before the experiments, these variables were not significantly correlated with the occurrence of sensed presences within the chamber during either sham field or magnetic field conditions. The critical factor for the experience of powerful sensed presences was the generation of the appropriate configuration of transcerebral magnetic fields.

We congratulate our colleagues in Sweden for the courage to begin the steps to replicate experiments that may allow neuroscience to systematically explore experiences hereto attributed to mystical or religious sources. However, the importance of replicating the specific timing and pattern of the magnetic field is as critical in this area of science as carefully adhering to the steps of synthesizing a compound is in organic chemistry.

References

[1] L. Baker-Price, M.A. Persinger, Weak but complex pulsed magnetic fields may reduce depression following traumatic brain injury, Percept. Motor Skills 83 (1996) 491–498.
[2] L. Baker-Price, M.A. Persinger, Intermittent bust-firing weak (1 microTesla) magnetic fields reduce psychometric depression in patients who sustained closed head injuries: a replication and electroencephalographic validation, Percept. Motor Skills 96 (2003) 965–974.
[3] J.N. Booth, S.A. Koren, M.A. Persinger, Increased proportions of sensed presences and occipital spikes with 1- and 10-ms point durations of continuous 7-Hz transcerebral magnetic fields, Percept. Motor Skills 97 (2003) 951–952.
[4] C.M. Cook, M.A. Persinger, Geophysical variables and behavior: XCII. Experimental elicitation of the experience of a sentient being by right hemispheric, weak magnetic fields: interaction with temporal lobe sensitivity, Percept. Motor Skills 92 (2001) 447–448.
[5] N.P. Granqvist, M. Fredrikson, P. Unge, A. Hagenfeldt, S. Valid, D. Larhammar, M. Larsson, Sensed presence and mystical experiences are predicted by suggestibility, not the application of transcranial weak complex magnetic fields, Neurosci. Lett.
[6] F. Healey, M.A. Persinger, S.A. Koren, Enhanced hypnotic suggestibility following application of burst-firing magnetic fields over the right temporoparietal lobes: a replication, Int. J. Neurosci. 87 (1996) 201–207.
[7] S.A. Koren, M.A. Persinger, Possible disruption of remote viewing by complex weak magnetic fields around the stimulus site and the possibility of accessing real phase space: a pilot study, Percept. Motor Skills 95 (2002) 989–998.
[8] L.J. Martin, S.A. Koren, M.A. Persinger, Thermal analgesic effects from weak, complex magnetic fields and pharmacological interactions, Pharm. Biochem. Behav. 78 (2004) 217–227.
[9] M.A. Persinger, Increased emergence of alpha activity over the left but not the right temporal lobe within a dark acoustic chamber: differential response to the left but not the right hemisphere to transcerebral magnetic fields, Int. J. Psychophysiol. 34 (1999) 163–169.
[10] M.A. Persinger, The neuropsychiatry of paranormal experiences, J. Neuropsychiatry Clin. Neurosci. 13 (2001) 515–524.
[11] M.A. Persinger, The sensed presence within experimental settings: implications for the male and female concept of self, J. Psychol. 137 (2003) 5–16.
[12] M.A. Persinger, F. Healey, Experimental facilitation of the sensed presence: possible intercalation between the hemispheres induced by complex magnetic fields, J. Nervous Mental Dis. 190 (2002) 533–541.
[13] M.A. Persinger, P.M. Richards, S.A. Koren, Differential entrainment of electroencephalographic activity by weak complex electromagnetic fields, Percept. Motor Skills 85 (1997) 527–536.
[14] M.A. Persinger, S.G. Tiller, S.A. Koren, Experimental simulation of a haunt experience and elicitation of paroxysmal electroencephalographic activity by transcerebral complex magnetic fields: induction of a synthetic "ghost"? Percept. Motor Skills 90 (2000) 659–674.
[15] P.M. Richards, S.A. Koren, M.A. Persinger, Experimental stimulation by burst-firing weak magnetic fields over the right temporal lobe may facilitate apprehension in women, Percept. Motor Skills 75 (1992) 667–670.
[16] L. Sculthorpe, M.A. Persinger, Does phase-modulation of applied 40 Hz transcerebral magnetic fields affect subjective experiences and hypnotic induction? Percept. Motor Skills 97 (2003) 1031–1037.
[17] S.G. Tiller, M.A. Persinger, Geophysical variables and behavior: XCVII. Increased proportions of left-sided sense of presence induced experimentally by right hemispheric application of specific (frequency-modulated) complex magnetic fields, Percept. Motor Skills 94 (2002) 26–28.

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